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It is not the purpose of this talk to simply show slides of graphs of commercial fishery landing statistics and discuss the reasons for trends of various stocks. Instead, I want to address the issues. I see coastal resource assessment/management facing four main issues: understanding and partitioning the causual forces for resource abundance fluctuations, the separation of powers between water quality and living marine resource management agencies, legislative vs regulatory management, and loss of estuarine habitat.

Causes for stock fluctuations

Resources that comprise our marine fisheries fluctuate for three basic reasons, 1) Natural environmental fluctuations, 2) Anthropogenic environmental modifications, and 3) Harvest pressure. While it is easy to document trends in abundance, pinpointing which of the above three are the causal agent of change is difficult at best. Generally, in varying combinations, all three come to play. Unfortunately, each scientist has his or her own pet theory, and the most eloquent is the one to sway the resource

manager into action. Perhaps most significant, is our inability to preact to the problems to head them off.

Aside from esthetic reasons we conserve our marine resources so as to perpetuate them for future generations to harvest. Harvest pressure is the easiest control to effect, and to which the stocks respond the fastest. If, over harvest was the casual factor for the stock decline. If natural or anthropogenic environmental fluctuations are the driving force then harvest control is ineffective, and the harvesters, the fishermen, unfairly impacted. Further, if natural climate shifts or unseasonal weather results in reduced recruitment rates or makes a stock unavailable to harvest, and expensive pollution abatement controls are exercised, there will be no recovery. In both of the above instances what we can control was, but to no avail; consequently, the credibility of scientist and manager is reduced.

Agency dichotomy

Most states, even those with a Department of Natural Resources, manage their living marine resources and the aquatic environment from two different agencies. This dichotomy has, in the past, lead to regulations and/or legislation, or a failure to pass regulations and/or legislation, that were not in the best interest of the resource. Case in point is the striped bass. One eastern coast state marine resources commission, after passing the Interstate Fisheries Management Plan for Striped Bass in 1982, called upon the state's water quality agency to enact regulations that would protect water quality on the spawning grounds during the spawning season. The water quality agency proposed instead to wait until all research on the

subject had been finalized. We are still waiting. If stringent fishing regulations increase the number of spawning fish in a river, but the young continue to suffer mortalities due to poor water quality then only the fish and fishermen loose.

Legislative vs regulatory authority

Management of marine resources in state waters must be by professional managers, not legislators. State General Assemblies should pass broad guidelines and set policy for the management agencies. Qualified Commissioners should be appointed, but the agencies left to conduct their business without political inference. All too often the PAC's (Politically Active Coalition) encourage a General Assembly to pass legislation favorable to their specialized economic interest. The resulting legislation promotes one user group, say sportfishermen, above that of another, the commercial fishermen; and, often results in a situation that restricts the options of the management agency.

Size limits or seasons should be in regulations, not legislation. They may need to be changed from time to time to react, or hopefully to preact, to changing stock conditions.

Habitat loss

The "estuarine dependence" of as many as 90% of our commercial and recreational species is an often cited figure. National Marine Fisheries

Service estimates are that estuarine dependent commercial fisheries generate $5.5 Billion and recreational activities $13.5 Billion.

Man's activities alter this estuarine environment in several ways. Since several of today's sponsoring agencies have primary responsibility for the supralittoral, the dry land, I feel I should start with a terrestrial example. We cite the coastal marine environment as fertile in part due to the vast salt and freshwater marsh systems; with the marshes producing 3-4 tons/acre/year of detritus for recycling. Spring marsh fires along the Atlantic east coast, particularly from Delaware south to Georgia, to clear the marsh to facilitate picking the wild asparagus, potentially remove 300 to 1,000 tons of detritus from each local ecosystem in the form of smoke.

Permanent habitat loss along the Atlantic seaboard must be rated as a primary concern. The effects of overharvest or pollution can be mitigated, but once a wetland become a shopping center or trailer park it is lost permanently. The state of Connecticut has lost 60% of its wetlands, all on the Long Island Sound north coast, and New York has lost over 50% of its wetlands, about a third on the Sound. We may never be able to formulate the ratio of acres of lost wetland to tons of harvest decline. Compensatory responses, the reproductive buffer capacity of the fish, crabs or oyster population masks the pressure. But, all systems have their capacity. This buffering ability makes a resource appear resilient, and therefore vulnerable. Years of wetland loss, and water quality degradation are masked. Then, when the buffer is finally full, the stock declines. The harvester is blamed and controls placed on them.

An example of a stock that fluctuates due to natural environmental variation is the Atlantic croaker. Research has shown that over 90% of the year to year variability in recruitment is due to shifts in wind patterns and winter temperature extremes. Consequently, efforts to regulate abundance through control of harvest pressure are likely to fail.

Scientists often, to the impatience of the manager, cite the need for more research. It sounds self serving, yet when the decisions need to be made, the manager turns to the scientist for answers. An over looked, but increasingly important area of science is monitoring. Monitoring programs are unglamorous, no Nobel Prizes have ever gone to a scientist that headed a monitoring team. Yet, monitoring is how were see trends and changes; and data from a monitoring program are the input to the time series models that allow us to forecast.

Recommendations

Water Quality and Living Resource Management agencies need to work together on a regular basis, particularly in the development of Fishery Management Plans. If particular water quality criteria are developed for a species, and they appear in the FMP, then the water quality enforcement must carry equal weight with enforcement of harvest controls (minimum size limits, closed seasons, etc.).

State legislatures should develop statements of marine resource policy along the lines of the Magnuson Fisheries Conservation and Management Act then

give the management agencies the authority as well as the responsibility to actively manage the resources. Simply enforcing the laws is not enough.

Irreplaceable loss of estuarine habitat, which is approaching 50% of the Nation's total must be halted. Wetlands acts at the national and state level have done much since 1972 to slow the destruction of tidal wetlands, but the encroachment of man from the land continues at a rate faster than that of the rising sea level.

We must learn to differentiate the causual forces of resource trends and fluctuations into their respective partitions. Natural, anthropogenic, and harvest pressures are each dealt with differently, and by different agencies. Controls placed on the wrong force will ultimately fail.